

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter Of:)

Amendment of the Commission's
Rules to Establish New Personal
Communications Services)

) GEN Docket No. 90-314
) ET Docket No. ~~92-100~~
)
) RM-7140, RM-7175, RM-7617, RM-7618,
) RM-7760, RM-7782, RM-7860, RM-7977,
) RM-7978, RM-7979, RM-7980
)
) PP-35 through PP-40,
) PP-79 through PP-85

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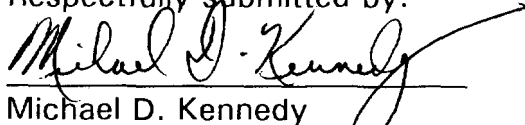
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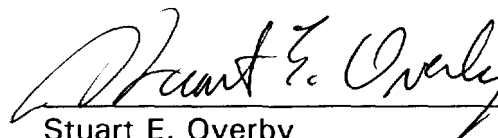
REPLY COMMENTS OF MOTOROLA INC.

Motorola Inc. ("Motorola") herewith submits its reply to comments in the above-captioned proceeding concerning new Personal Communications Services ("PCS"). Motorola's original comments in this docket provided a comprehensive plan for rapid deployment of terrestrial PCS in the 2 GHz and 900 MHz bands, detailing both band plans and revised regulations crafted to facilitate competitive, diverse, and ubiquitous PCS offerings. As discussed below, Motorola's recommended modifications to the Commission's original proposals received broad based industry support in the opening comments. Motorola thus believes the public would be well-served by adopting the regulatory framework described herein.

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EXECUTIVE SUMMARY

- MOTOROLA'S RECOMMENDED 2 GHz BANDPLAN ACCOMMODATES A VARIETY OF COMPETITIVE PCS SYSTEMS, PROMOTES RAPID INTRODUCTION OF PCS OFFERINGS, AND RETAINS U.S. FLEXIBILITY TO IMPLEMENT NEW MOBILE SATELLITE SERVICES CONSISTENT WITH WARC-92 DECISIONS.
- THE TECHNICAL RULES FOR 2 GHz LICENSED SERVICES SHOULD BE MODIFIED TO CONFORM TO MORE REALISTIC DEPLOYMENT SCENARIOS.
 - ▶ COORDINATION CRITERIA MUST BE REVISED TO INCLUDE MODIFICATIONS TO TSB10-E, OPTIONS FOR AGGREGATING CUMULATIVE POWER MEASUREMENTS, AND EXTENSION OF THE HEIGHT-POWER COORDINATION TABLE.
 - ▶ RELIANCE ON CAREY CURVES IS AN INAPPROPRIATE MEANS TO DESIGNATE 2 GHz LICENSED SERVICE AREAS.
 - ▶ INTEROPERABILITY IS CRITICAL FOR THE COMMERCIAL SUCCESS OF PCS AND INDUSTRY DEVELOPED COMMON AIR INTERFACES SHOULD BE ENCOURAGED.
- THE COMMENTS EXHIBIT WIDESPREAD SUPPORT FOR RAPID INTRODUCTION OF 2 GHz UNLICENSED DEVICES. SUCH INTRODUCTION REQUIRES:
 - ▶ COMMISSION ENDORSEMENT OF A CONSORTIUM TO MANAGE RELOCATION OF EXISTING USERS IN THE 1910-1930 MHz BAND.
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- MOTOROLA'S PROPOSED 900 MHz BANDPLAN ALLOWS MORE ECONOMICAL AND SPECTRALLY EFFICIENT NARROWBAND PCS OPERATION BY INCORPORATING INDUSTRY CONSENSUS REVISIONS THAT INCLUDE ASYMMETRICAL AND SYMMETRICAL PAIRINGS, A LOW-POWER TALK-IN BAND, A VARIETY OF SYSTEM BANDWIDTHS, NATIONAL AND REGIONAL LICENSES, AND FLEXIBLE TECHNICAL RULES.
- MOTOROLA SUPPORTS IMPROVEMENTS TO THE APPLICATION AND LOTTERY PROCESS TO ENSURE SELECTION OF QUALIFIED APPLICANTS AND DETER SPECULATION.

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I. INTRODUCTION

Motorola's original comments presented the Commission with a sound regulatory plan for jump-starting terrestrial based PCS services in the shared microwave environment dictated by the Commission's Emerging Technology Proceeding decisions. Motorola detailed a 2 GHz bandplan that accommodates a variety of both licensed and unlicensed PCS devices and maintains options for subsequent allocations to the mobile satellite services, consistent with decisions reached at WARC-92. Motorola also offered a 900 MHz narrowband PCS bandplan that enhances spectral efficiency, decreases deployment costs and supports a diverse range of narrowband PCS systems. As discussed below, adopting these basic recommendations, in conjunction with consensus modifications to the Commission's proposed technical rules, will promote the rapid and economic deployment of PCS.

Motorola's recommended proposals to advance new 2 GHz services are intended to provide maximal flexibility for a diverse variety of new services and technologies that address specific, documented public needs. Motorola's bandplan creates two 40 MHz allocations for wide area PCS, one 10 MHz allocation for local area PCS, a 20 MHz allocation for unlicensed devices and a 10 MHz allocation which the Commission could choose to use either for local area PCS operation or for additional unlicensed devices. In this manner, Motorola's plan permits deployment of both wide area and localized licensed PCS systems as well as unlicensed PCS devices, accommodates both frequency division and time division

duplex architectures, provides a realistic amount of spectrum for sharing between PCS providers and fixed microwave users to enable rapid deployment, and retains the option to provide future allocations in the 2 GHz band for mobile satellite based PCS systems.

For 2 GHz licensed services, Motorola also proposed minor technical revisions to the operational rules which will facilitate the practical introduction of new 2 GHz services. In particular, Motorola suggests the Commission:

- Adopt technical standards providing a more pragmatic model for sharing between PCS and fixed microwave users, including modifications to TSB10-E, new procedures to ease PCS system modifications and coordination calculations, and a revised coordination table more accurately reflecting the facilities of new PCS entrants.
- Utilize a methodology other than the Carey approximation to predict 47 dBu contours for 2 GHz licensed services.
- Ultimately endorse industry developed common air interface standards for licensed 2 GHz PCS to promote competitive and universal services.

Motorola also takes this opportunity to provide additional detail on its proposal for an unlicensed PCS manufacturers' consortium to oversee the reaccommodation of existing microwave systems now operating in the 1910 - 1930 MHz band. The Commission's Emerging Technology decision establishes voluntary relocation negotiations as the prime method for clearing the bands for PCS. For unlicensed PCS, however, no central negotiating entity will exist unless such a consortium is established.

In this Reply, Motorola discusses various options for such a consortium, and the financial, legal, and practical ramifications of each option. As shown by this discussion, a mandatory, open industry consortium is a necessary mechanism to reaccommodate existing microwave users now operating in the 1910 - 1930 MHz band proposed for unlicensed PCS. The consortium as proposed would spread the significant cost of reaccommodating microwave users fairly among all manufacturers who choose to market unlicensed PCS devices.

Motorola's 900 MHz proposals are tailored to achieve rapid deployment of narrowband PCS systems while lowering infrastructure costs and preserving licensee flexibility. In particular, the Motorola 900 MHz plan presented in our original comments has the following industry-consensus features:

- Both 50 kHz/12.5 kHz asymmetrical paired channels and 150 kHz/150 kHz symmetrical paired channels.
- A dedicated low-power talk-in band at 901-902 MHz.
- Liberal post-grant channel division and stacking policies that permit each licensee maximum technical flexibility in system implementation.
- Nationwide and large regional licenses rather than local licenses.
- Technical rules designed to increase flexibility without aggravating the potential for intersystem interference.

By adopting these features, the Commission will be able to accommodate the widest variety of proposed system types and configurations while optimally balancing competition, administrative convenience, spectral efficiency, and flexibility.

As a final matter, Motorola recommends adopting a number of substantive reforms to the licensing process to accelerate the deployment of PCS services by ensuring qualified entrants and discouraging speculation. Motorola's recommendations include substantial filing fees, market-specific financial qualifications, demonstrations of financial ability to relocate existing 2 GHz microwave users, construction deadlines and coverage requirements, applicant-specific engineering showings, reasonable assurances of site availability, and a prohibition on interests in multiple applications for the same region.

By adopting these recommendations, which are consistent with the comments of the industry overall, Motorola believes the Commission will significantly ease the transition to -- and speed the advent of -- a new era in personal communications. Motorola's recommended modifications also provide a sound foundation for the launch of new PCS offerings by promoting universality, diversity, and competition while reducing administrative costs for both the Commission and new service and technology providers. Motorola thus submits the Commission should act favorably and expeditiously on the revisions recommended herein.

II. COMMENTERS STRONGLY SUPPORT REVISIONS TO THE COMMISSION'S PROPOSALS FOR 2 GHz PCS IN ORDER TO FACILITATE RAPID DEPLOYMENT OF PCS SERVICES AND INCREASE TECHNOLOGICAL FLEXIBILITY

A. Commenters Strongly Support Revisions To the Commission's Proposed 2 GHz Bandplan For Licensed PCS Services

In its comments, Motorola recommended that the Commission adopt a bandplan for 2 GHz PCS services that accommodates multiple technologies, avoids unduly constraining the classes of services that can be offered within each sub-allocation, and provides sufficient regulatory structure to attract capital.¹ In so doing, Motorola recognized that a variety of technologies will likely develop to satisfy the diversity of PCS markets and needs.² Fearing that the Commission's Notice did not adequately satisfy these considerations, Motorola proposed an alternative bandplan that further distinguishes and better accommodates multiple forms of PCS services.³ In particular, Motorola's comments proposed the following alternative bandplan:

¹ Motorola at 7.

² Id. at 23.

³ Id. at 9.

<u>BLOCK</u>	<u>SPECTRUM SEGMENT (MHz)</u>
A	1850-1870/1930-1950
B	1870-1890/1950-1970
C	1890-1900
D	1900-1910
E	1910-1930

- Blocks A and B are paired segments, 40 MHz per operator, providing wide area ubiquitous PCS public access services with power limits as outlined in section IV of our original comments.
- Block C is an unpaired 10 MHz segment which would be shared by two licensees, providing increased opportunity for small entrepreneurs to enter PCS.
- Block D is also an unpaired 10 MHz segment which could be shared by two licensees or used to expand the spectrum proposed for nonlicensed PCS.
- Block E is an unpaired 20 MHz segment for nonlicensed PCS as proposed by the Commission.

The record generated in this proceeding provides further evidence that the Commission's proposed bandplan fails to consider the challenge of implementing services in the shared microwave environment. The Commission's decisions in ET Docket 92-9 establish voluntary relocation as the primary means of clearing spectrum for PCS and other emerging technologies. The case-by-case involuntary relocation mechanism defined in the Commission's decision is such a long and arduous process that it is unlikely to provide any meaningful relief in initiating PCS service. Further, a substantial portion of microwave licensees are exempt from even the possibility of involuntary relocation.

Therefore, providing each licensee with sufficient spectrum in which to initiate service in the realities of the shared microwave environment is absolutely essential. Motorola's recommended bandplan provides the American public with two additional providers of wide area wireless service and multiple providers of local area service. The latter tier of service should be particularly helpful in attracting smaller entrepreneurs who desire to enter the PCS service market and in adding to the levels of competitive services offered.

A comprehensive analysis conducted by American Personal Communications ("APC") and already on record in this docket, shows that with 20 MHz per licensee, an average of 28 percent of a metropolitan area will have no spectrum available for PCS service until microwave users can be reaccommodated in other bands. Conversely, for a licensee who is authorized a 40 MHz segment, only 12 percent of a metropolitan area would have no spectrum available. Furthermore, APC's analysis provided the following comparisons of actual spectrum availability per licensee in the shared microwave environment which the Commission has established with its decisions in the Emerging Technology Proceeding:

Average Spectrum Availability for PCS⁴

No microwave links relocated

	2 Lic/40 MHz	3 Lic/30 MHz	5 Lic/20 MHz
	MHz	MHz	MHz
New York	24.8	18.5	12.2
Los Angeles	18.2	13.5	9.0
Chicago	19.3	14.7	9.8
Washington, D.C.	34.7	26.2	17.5
Philadelphia	28.9	21.2	14.1
Detroit	29.3	22.5	15.2
Boston	33.9	25.4	16.9
Dallas	24.3	18.3	12.2
Houston	21.2	16.2	11.1
Miami	25.3	19.3	12.8
San Francisco	22.7	17.1	11.3
Average	25.7	19.4	12.9

This analysis shows each licensee is seriously disadvantaged at startup if the Commission ultimately decides to award only 20 MHz per licensee as some commenters and an Office of Plans and Policy ("OPP") report have suggested.⁵ Motorola's concern with OPP's analysis focuses on the incumbent users of the proposed spectrum and their effect on the amount of spectrum each licensee needs to initiate PCS Service. The OPP paper provides a credible, though narrowly

⁴ "Report on Spectrum Availability for Personal Communication's Services Sharing the 1850-1990 MHz Band with the Private Operational Fixed Microwave Service" by American Personal Communications, November 1992, at 27.

⁵"Putting It All Together: The Cost Structure of Personal Communications Services" by David P. Reed, Office of Plans and Policy Working Paper No. 82, November 1992, at V and 53-55.

focused, economic analysis of a microcellular system. If one uses PCS as an alternative to cellular service, this analysis is invalid as it ignores the need for wide area coverage. Particularly in this latter case, the effect of the incumbent fixed users is a critical factor missing from the analysis. Therefore, Motorola cannot support the conclusion that 20 MHz is a sufficient amount of spectrum for each PCS licensee.

To be fair, OPP does suggest that licensees with 20 MHz of spectrum each be allowed the option of consolidating their spectrum to alleviate any congestion issues related to incumbent users. Given the existing microwave environment, Motorola believes that such consolidation would be absolutely essential if each licensee is limited to only 20 MHz.

The ability to provide customers adequate coverage at startup will be critical to a PCS operator's success. Therefore, the consolidation presented by OPP as merely an option would instead be a necessity to implement PCS service in the shared microwave environment, if licensees have only 20 MHz each. This will entail significant transaction costs and delays in establishing PCS service with no resulting benefit to the public.

Motorola's position of providing 40 MHz per licensee for wide area PCS services and one or two 10 MHz blocks with two licensees each for local area services is prudent policy. If spectrum was clear and easily accessible, OPP's conclusions might be valid. The realities of initiating PCS service in the shared

microwave environment as the Commission's emerging technology decision dictates, however, are quite different.

In addition to modifying its bandplan to help jump-start PCS in the shared microwave environment, Motorola believes the Commission must recognize that PCS encompasses multiple tiers of service. For example, while warning the Commission against defining PCS too narrowly, the National Telecommunications and Information Agency ("NTIA") points out that the Notice "proposes rules and seeks comment on regulatory approaches based on that of the cellular service."⁶ NTIA further observes that the Notice appears to assume that PCS will develop in a way that "at the extreme, would make it virtually indistinguishable from the existing cellular service."⁷

BellSouth echoes the comments made by NTIA and warns against the Commission creating 2 GHz "cellular clones" and that the Commission should instead encourage the development of "innovative new forms" of PCS.⁸ These comments support Motorola's position that wide area vehicular based systems are but one form of PCS and that the Commission should endeavor to accommodate and encourage other services through its technical standards and, particularly, its 2 GHz bandplan.

⁶ NTIA at 4.

⁷ Id. at 4.

⁸ BellSouth at 15.

Even more on point are the comments of Ameritech. Ameritech observes that the Commission apparently believes that its allocation for PCS will satisfy the dual goals of providing for a family of new and innovative services while introducing additional competition to existing mobile services. Ameritech warns, however, that "the proposed, single simplified regulatory scheme does not optimally address either" of these two requirements and that "these two needs require two solutions."⁹ As its response, Ameritech proposes "two-tiers" of PCS service with the first tier intended to satisfy wide area, high power PCS service similar to traditional cellular service and the second tier intended to satisfy lower power, consumer oriented services such as CT-2 or DECT.¹⁰

These commenters tend to agree with Motorola that the Commission could better serve the public interest by recognizing within its bandplan that PCS could assume multiple forms. The technical evidence presented throughout this proceeding as well as the FCC's experimental licensing process indicates that PCS services generally fall into two broad categories -- wide area services and local area services. Motorola urges the Commission to adopt a bandplan that recognizes the differences between the two categories and allocates spectrum accordingly to encourage the development of both. The resulting public interest benefits will be

⁹ Ameritech at 2.

¹⁰Id. at 5.

to facilitate the timely deployment of PCS and to encourage the development of innovative and diverse services.

B. The Record Contains Overwhelming Support for a 20 MHz Allocation To Unlicensed PCS Devices

Perhaps the proposal generating the greatest unanimity among commenters is the recommended allocation of 20 MHz of spectrum at 1910-1930 MHz for unlicensed PCS devices. With overwhelming support from both hopeful PCS service providers as well as equipment manufacturers, the Commission should now move quickly to allocate spectrum from the 2 GHz band for the exclusive use of unlicensed PCS devices.

Almost all commenters recognize that some form of PCS services could best be offered on an unlicensed basis. Many commenters echoed the comments of Motorola in pointing out that wireless PBX units, wireless data delivery services, cordless telephones and other home/office equipment are best delivered on an unlicensed basis.¹¹ In short, the record is well settled that the American consumer will benefit by an allocation for unlicensed PCS devices. In particular, the commenters are near unanimous in their recognition that the 1910 to 1930 MHz band proposal is best suited for use by unlicensed devices.¹²

¹¹ See e.g., Ameritech at 12; Andrew Corp. at 2-3; Centel at 13-14; Teknekron at 2; WINForum at 1; and Xircom at 3.

¹² See e.g., APC at 6; AT&T at 14; and IEEE Project 802 at 7.

Even while acknowledging that the 1910 to 1930 MHz band offers the best home for unlicensed devices, some commenters indicate that a 20 MHz allocation is inadequate to satisfy the immediate demand for the variety of services that unlicensed PCS devices will provide. For example, Apple Computer, Inc., states that demand is sufficient to justify an additional 20 to 45 MHz of spectrum beyond the Commission's initial proposal.¹³

Motorola appreciates comments suggesting that 20 MHz is an inadequate allocation for unlicensed devices. The demand for both licensed and unlicensed PCS may very well require more spectrum than proposed. Motorola itself recommended that the Commission consider the option of allocating an additional ten megahertz of spectrum for unlicensed PCS at 1900 to 1910 MHz.¹⁴ Notwithstanding this support, Motorola questions whether such additional allocations will offer any near term benefits to users of unlicensed PCS devices. As noted by numerous commenters as well as the Commission itself, the 1910 to 1930 MHz band is somewhat unique in that the number of microwave links occupying the band is relatively small.¹⁵

Therefore, the task of clearing that spectrum for unlicensed devices, although still wrought with difficulties and significant costs, will be a far easier

¹³ Apple Computer at 3.

¹⁴ Motorola at 9.

¹⁵ Amendment of the Commission's Rules to Establish New Personal Communications Services, 7 FCC Rcd 5676 , 5724 (1992) (Notice of Proposed Rule Making and Tentative Decision) ("Notice").

task in 1910-1930 MHz than in other portions of the band. For example, the attached figures depict graphically the microwave receivers that would have to be protected or moved in the 1910-1930 MHz (fig. 1), and 1890-1930 MHz (fig. 2) bands, respectively. As clearly seen from these figures, expanding the allocation for unlicensed PCS significantly expands the problem of reaccommodating microwave users. Finally, while additional allocations for unlicensed devices should be carefully considered, the Commission should not delay the immediate allocation of the 1910-1930 MHz band for unlicensed PCS.

C. The Record Supports Retaining Flexibility for Future 2 GHz Allocation Decisions

Motorola, and others, believe that the Commission should retain flexibility to make future 2 GHz mobile satellite service ("MSS") spectrum allocations consistent with decisions made at WARC-92.¹⁶ As Motorola previously observed, the U.S. delegation "fought hard at WARC-92 to provide the option for additional [MSS] allocations,"¹⁷ resulting in a Region II option to utilize the 1970-2010/2160-2200 MHz bands for MSS. A portion of these bands, however, overlap the proposed PCS allocation above 1970 MHz.

¹⁶ Motorola at 10; APC at 20; Celsat at 10-11; COMSAT at 5.

¹⁷ Motorola at 10.

Figure 1 1910-1930 Mhz

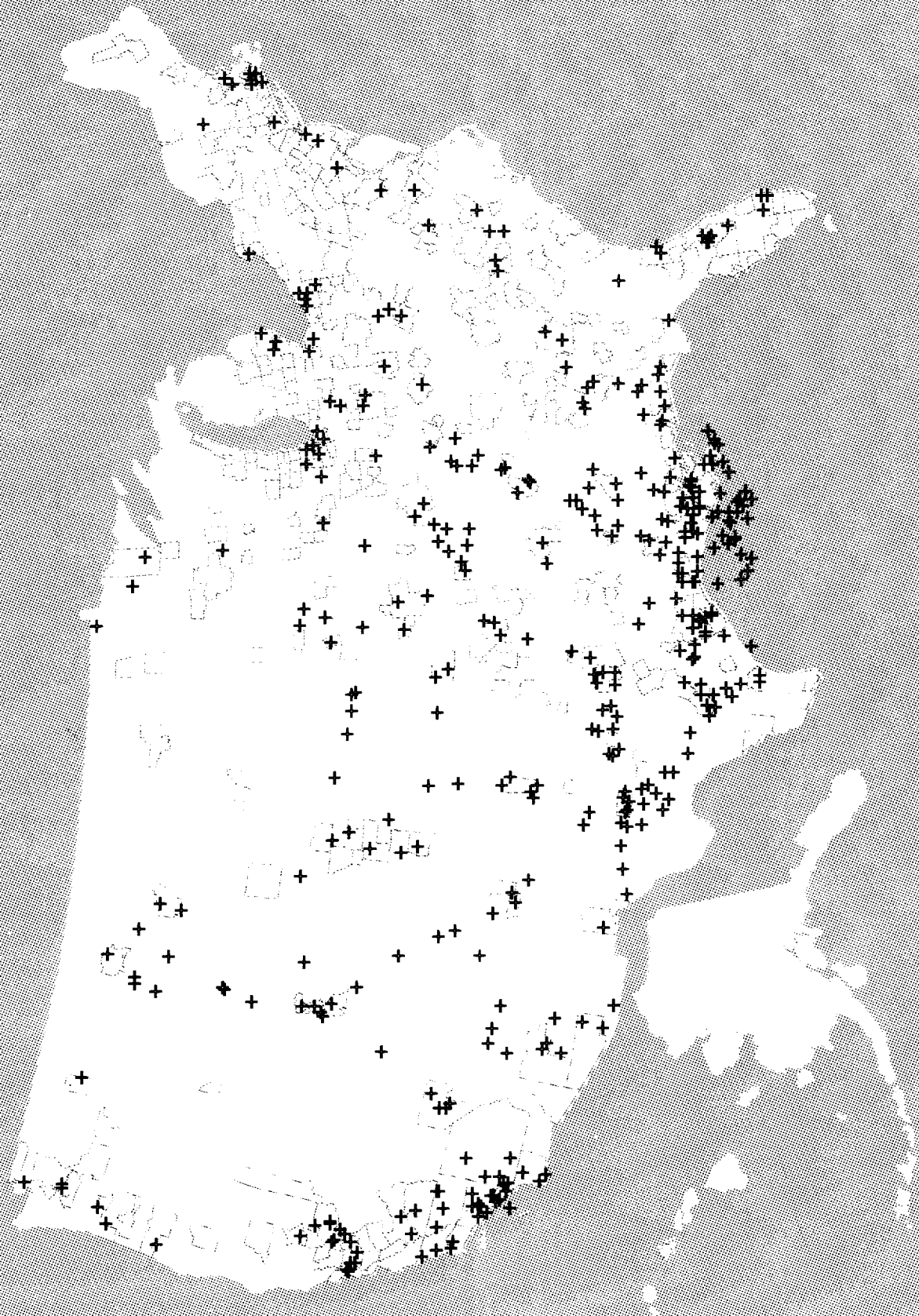
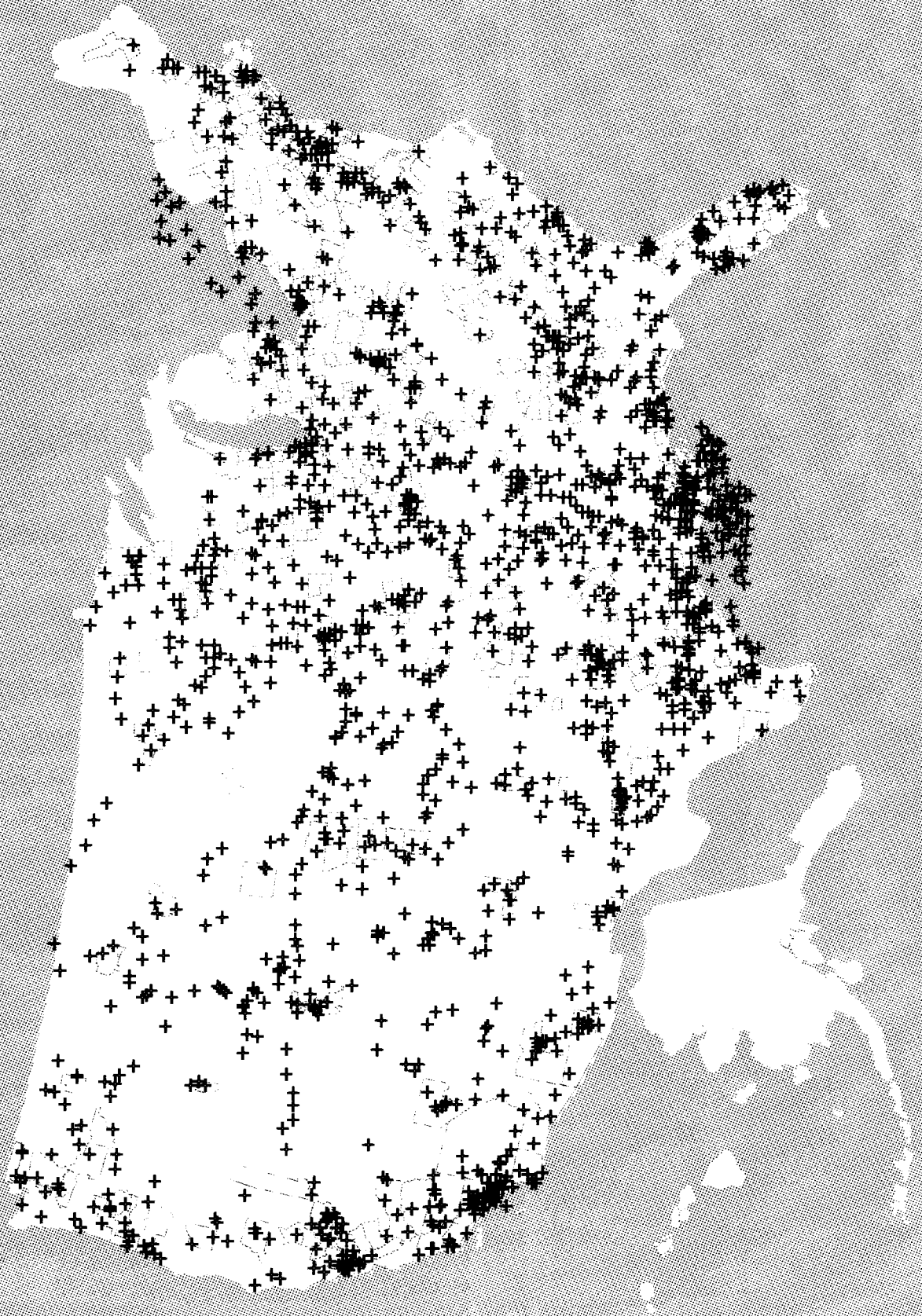


Figure 2 1890-1930 Mhz



COMSAT has observed that MSS "has an important role to play in PCS."¹⁸ Motorola also believes that Low Earth Orbit ("LEO") systems, in particular, "can provide a layer of universality that cannot be matched by terrestrial based or geosynchronous satellite systems."¹⁹ Accordingly, the Commission should retain the flexibility to make a future domestic MSS allocation consistent with WARC-92 decisions.

III. THE COMMENTS SUPPORT REVISIONS TO THE PROPOSED TECHNICAL RULES FOR 2 GHz LICENSED SERVICES TO PROMOTE MORE PRACTICAL INTRODUCTION OF NEW SERVICES

A. The Record Demonstrates That the Commission's Proposals for PCS Interference Coordination Should Be Modified

While the majority of the comments recognized that EIA/TIA's Bulletin TSB10-E was an appropriate starting point for evaluating PCS-to-fixed microwave coordination, numerous revisions to the Commission's scheme were suggested. Specifically, parties suggested that TSB10-E should be subject to continuing industry refinement, that changes were needed to the proposed aggregation of PCS interference levels at the microwave receivers, and that the PCS-to-fixed microwave coordination table must be adjusted to reflect the lower powers and antenna heights likely to be used by PCS licensees. In a related matter, parties

¹⁸ COMSAT at 2-3.

¹⁹ Motorola at 10.

also suggested revising the Commission's proposal for defining reliable service areas for PCS licensees. As discussed below, Motorola believes the suggested modifications, where justified by sound engineering practice, should be adopted.

1. TSB10-E requires continuing refinement by appropriate industry representatives

Currently, protection criteria for fixed microwave operations are contained in Part 94 of the Commission's rules and further described in TSB10-E, which provides a starting point for PCS-to-microwave coordination.²⁰ However, as APC noted, "[e]xisting standards . . . were designed for static, fixed applications that are initiated and modified only relatively infrequently," and consequently "specially crafted interference protection rules are necessary" for PCS-to-fixed microwave coordination.²¹ As discussed below, in the absence of substantive changes to TSB10-E, existing microwave coordination procedures may provide protection beyond that necessary for reliable service. In turn, this could have a severe detrimental impact on the potential for PCS/microwave sharing.

²⁰ E.g., Motorola at 34; AGA at 2; APC at 54-55; API at 13; AAR at 1-2; Bell Atlantic at 47; Comcast at 39; Comsearch at 10-11; CTP at 6-7; Edison Electric Institute at 3; Ericsson at 17; Harris Corporation - Farinon Division at 3; Matsushita at 3; Northern Telecom at 35; PSMC at 4; Sprint at Appendix A p. 1; Telocator at 18; UTC at 7.

²¹ APC at 55.

Specifically, commenters identified a number of potential problems with the use of TSB10-E, in its current form, for PCS-to-fixed microwave coordination. In particular, commenters noted that current procedures:

- Are designed to protect a fade margin rather than path availability.²²
- Make no allowances for very short haul links, which generally provide high availability with less fade margin.²³
- Contain an excessive "built in" 40 dB fade margin for any analog link coordination.²⁴
- Have interpreted "practical threshold" in a questionable manner.²⁵
- Do not recognize the existence of links with excessively high power levels due to grandfathered status granted by the Commission in 1986 when reduced power requirements as a function of link length were implemented.²⁶

As parties have noted, some of these issues will be addressed in an upcoming revision to TSB10-E, and the new revision should govern PCS-to-fixed microwave coordination in the future.²⁷ Motorola, and others, believe that as long as the industry is continuing to address these issues constructively, direct Commission prescription of coordination standards is unnecessary and, indeed, the rules should

²² Motorola at 35; APC at 55; PCN America at 8; Telocator at 18.

²³ Motorola at 35.

²⁴ Motorola at 35; Bell Atlantic at 46; Comsearch at 4-5; PCN America at Appendix I p. 4.

²⁵ Motorola at 35; APC at Appendix F p. 7.

²⁶ Motorola at 35.

²⁷ E.g., APC at 55; Comsearch at 10; Edison Electric Institute at 3; Harris Corporation - Farinon Division at 3; LCC, Inc. at 3; Sprint at Appendix A p. 2.

provide flexibility to incorporate industry consensus revisions to coordination documents like TSB10-E.²⁸

2. The proposal for aggregation of PCS interference at the microwave receiver requires modification

Motorola, and numerous other parties, have also argued for modifications to the Commission's proposal for aggregating PCS interference at the microwave receiver using straight power addition. As an initial matter, modifications have been requested to ease the process of calculating interference and modifying PCS systems. In particular:

- Aggregation of base station transmit powers at a mean antenna height should be allowed where all, or subgroups of, base station antennas are at a similar height (e.g., no antenna higher than three times the height of the shortest antenna) and the distance to the microwave receiver is substantially greater than the radius of the area of base station distribution (e.g., 10:1).²⁹
- PCS licensees should be allowed to make system modifications within the aggregation limits without subsequent re-coordination, although notice to microwave licensees within the coordination contour may be advisable to maintain accurate records.³⁰

Motorola believes that these simple modifications will not affect the level of noise experienced by fixed microwave licensees, but will allow significant, needed flexibility for PCS operators.

²⁸ E.g., Motorola at 35; Comcast at 40; Comsearch at 6; Matsushita at 4-5.

²⁹ Motorola at 36 n.18.

³⁰ Motorola at 37; APC at 56; AAR at 2.

In addition, Motorola and others believe modifications to reflect interference potential more accurately are desirable. In particular:

- PCS licensees should be permitted to de-aggregate mobile and portable power levels from the base station center where the cell is large and located relatively close to the microwave receiver. In such cases, licensees should be permitted to make reasonable assumptions regarding the two-dimensional distribution of mobiles and portables within the cell.³¹
- A probability term should be factored into interference calculations to reflect the number of mobiles and portables that will be operational at any given time. Considering trunking efficiencies and other factors, Motorola suggests that a conservative probability term of 50 percent could be employed.³²

These proposed modifications incorporate reasonable assumptions regarding the actual use of PCS systems and thus lead to more accurate calculations of potential interference.

3. The PCS-to-microwave coordination table must be extended to accommodate lower PCS facilities likely to be employed

Motorola, with the support of a number of other commenters, has suggested that the Commission's coordination table should be revised to reflect lower PCS antenna heights and transmitter powers.³³ This table governs whether a PCS licensee will be required to coordinate with microwave licensees in the area based

³¹ Motorola at 37.

³² Motorola at 37; AAR at 2; CNet at 5-7; LCC at 6; Sprint at Appendix A p. 2.

³³ Motorola at 39; Northern Telecom at 36-37; PCN America at 10.